IN THE CLAIMS:

The following is a complete listing of claims in this application.

7. (currently amended) In a BAYER circuit including a preliminary agglomeration phase, a crystal growth phase and a classification phase, a process for controlling precipitation of alumina hydrate from a slurry resulting from introduction of recycled alumina trihydrate seed into an aluminate liquor, in which particle size quality of alumina hydrate produced in the circuit and circulating in feed tanks is monitored, comprising the steps of:

a) a calibration step including:

a1) measuring, versus time, of:

percent of alumina hydrate particles circulating in the feed tanks in the circuit that are finer than X2 µm; and

percent of alumina hydrate particles circulating in the feed tanks in the circuit that are finer than X1 µm;

where X1 and X2 are predetermined particle sizes <u>in microns</u> and X1 is smaller than X2; and

a2) determining a relationship R between percent finer than X1 and later changes in percent finer than X2 <u>µm</u>, and defining upper and lower trigger thresholds of percent finer than X1 <u>µm</u> which correspond to maximum permissible variations in percent finer than X2 <u>µm</u>; and

b) controlling the circuit, comprising measuring percent finer than X2 <u>µm</u> and forming a correlation between percent finer than X2 <u>µm</u> and the particle size of hydrate produced by the circuit, measuring percent finer than X1 <u>µm</u> and updating the relationship R, and causing corrective action to the slurry at the beginning of precipitation when the measured value of percent finer than X1 <u>µm</u> reaches an updated trigger threshold, to bring the percent finer than X2 <u>µm</u> within the

LAW OFFICES
DENNISON, SCHULTZ, DOUGHERTY & MACDONALD
SUITE 105
1727 KING STREET
ALEXANDRIA, VIRGINIA 22314-2700
703 837-9600

maximum permissible variation.

8. (previously presented) Process according to claim 7, wherein said corrective action includes modifying amount of solid in the slurry at the beginning of the precipitation.

9. (previously presented) Process according to claim 8, wherein the modifying comprises varying amounts of pregnant aluminate liquor fed to a first agglomeration tank and a first feed tank.

10. (previously presented) Process according to claim 7, wherein X2 is greater than 40 µm and X1 is less than 20 µm.

11. (previously presented) Process according to claim 7, wherein the measurements of percent finer than X1 µm and percent finer than X2 µm are made on a slurry at the end of crystal growth phase.

12. (previously presented) Process according to claim 7, wherein pregnant aluminate liquor feeding a first agglomeration tank in the circuit has a caustic content less than or equal to 160 g of Na_2O/liter.

13. (currently amended) Process according to claim 7, wherein said calibration step comprises:

1) daily measuring percent finer than X1 µm in the slurry at a predetermined point in the circuit, which is used to produce a first particle size vs. time diagram represented by a curve $Y = \%<X1(t)$;

2) daily measuring percent finer than X2 µm in the slurry at a predetermined point in the circuit, which is used to produce a second particle size vs. time diagram represented by a curve $Y = \%<X2(t)$ and in which $X2>X1$ is a value already known to be well correlated with the particle size of the hydrate produced;

3) creating of an empirical relation between the particle size vs. time diagrams, which characterizes the relation R as:

$$R(\%<X2(t),\ \%<X1(t-\tau)) = 0$$

where t is the time at which percent finer than X2 µm is measured and τ is a characteristic time interval estimated by observing an occurrence of a same accidental phenomenon on each curve $\%<X2(t)$ and $\%<X1(t-\tau)$; and

4) defining a maximum threshold and minimum threshold of percent finer than X1 µm obtained from the ~~relation~~ relationship R and a maximum interval of the permissible variation of values of percent finer than X2 µm.

14. (currently amended) Process according to claim 13, wherein said controlling comprises:

1) daily measuring percent finer than X1 µm in the slurry at a predetermined point in the circuit, in order to complete the first particle size time diagram represented by the curve $Y = \%<X1(t)$;

2) daily measuring percent finer than X2 µm in the slurry at a predetermined point in the circuit, in order to complete the first particle size time diagram represented by the curve $Y = \%<X2(t)$;

3) updating a relationship between curve $Y = \%<X1(t)$ and curve $Y=\%<X2(t)$ and the definition of trigger thresholds of percent finer than X1 µm; and

4) triggering of a corrective action to modify amount of solid in the slurry at the beginning of the precipitation when the measured value of percent finer than X1 µm reaches one of the thresholds defined in 3).